

REMARKS

By this amendment, applicant has canceled claim 3 and added new claim 4 to correct clerical errors in claim 3. Applicant has also amended the application to add a drawing figure consisting of a flow chart showing the method for estimating the volume ratio of gas to oil (GOR) in the fluids of a well during drilling according to the present invention. Applicant has also added a Brief Description and amended the Detailed Description of the Invention to refer to the new drawing figure. The new drawing figure is supported by the remainder of the disclosure and the original claims. Applicant has also amended the abstract to be in proper form.

The Examiner has objected to the drawings under 37 CFR 1.83(a) as failing to show the claimed method steps. This objection is traversed, least in view of the addition of the new figure to the application.

In the first place, it is submitted neither the statutes nor regulations require a drawing in the subject application. 35 U.S.C. 113 and 37 CFR 1.81 require a drawing only "where necessary for the understanding of the subject matter sought to be patented." It has long been the practice of the U.S. Patent and Trademark Office to treat an application that contains at least one process or method claim as an application for which a drawing is not necessary for an understanding of the invention. Manual Patent Examining Procedure (MPEP) 601.01(f). Since all of the claims in the application are method claims, it is submitted a drawing is not necessary for an understanding of the invention.

Nevertheless, in order to advance the prosecution of the application, Applicant has amended the application to include a flow chart showing the method for

estimating the volume ratio of gas to oil (GOR) in the fluids of a well during drilling according to the present invention.

Accordingly, reconsideration and withdrawal of the objection to the drawings are requested.

In view of the foregoing amendments to the abstract, reconsideration and withdrawal of the objection to the abstract in numbered section 2 of the Office Action and to the disclosure in numbered 3.I of the Office Action are requested.

Applicant has also amended page 1, line 14 of the specification to insert a specific reference to U.S. Patent Nos., 5,635,631 and 5,612,493, as required by the Examiner in numbered section 3.II of the Office Action.

The Examiner's objection to the disclosure in numbered section 4.I of the Office Action is unclear and traversed. The Rock-Eval. Technique described at page 3, lines 15-22 of Applicant's specification concerns only a means to compute the total organic carbon (TOC) present in a rock sample. This is clearly described at page 3, lines 15-22 of the specification. It is not believed any amendment to page 3 of the specification is necessary. However, Applicant is submitting herewith an Information Disclosure Statement requesting that the Examiner consider U.S. Patent Nos. 5,843,787; 6,229,086; 4,352,673; and 4,153,415.

Claims 1-3 stand rejected under 35 U.S.C. 102(b) as being anticipated by the Alexander patent. In connection with a statement of the rejection in numbered section 8 of the Office Action, it is assumed the reference to the U.S. Patent 6,031,548 is a clerical error and that the Examiner is referring to U.S. Patent 5,612,493 listed on form PTO-892. Applicant traverses this rejection and requests reconsideration thereof.

The claimed method allows to estimate the volume ratio of gas to oil (GOR) in the fluids of a well during drilling. The method comprises:

- determining the volume of gas (V_g) contained in the drilling fluids by measuring a ratio (R) between a volume of gas produced and a corresponding volume of drilled rock,
- determining the volume of oil (V_o) by measuring the total organic carbon (TOC) in the drilled rock while taking account of physical characteristics of the drilled rock and the oil under the surface conditions, and
- determining said volume ratio (GOR) by calculating the ratio of the previously determined volumes of gas and of oil.

Alexander discloses a method for measurement of the rate of a gas/oil ratio. To compute such a ratio, it is necessary to compute gas volume and oil volume.

Alexander discloses a method to compute gas volume from the bubble-point pressure, the well's annular gas rate and the flowing bottom hole pressure.

Alexander does not disclose the determination of gas volume by measuring the ratio R between a volume of gas produced and a corresponding volume of drilled rock. This ratio R is measuring from the gas concentration of mud, the flow of mud, the rate of penetration of the drill bit and the borehole diameter. This can be done while drilling, contrary of the method described by Alexander (see column 3, lines 61-63).

Alexander does not disclose a method to compute oil ratio. See column 6, lines 47, and column 7, line 65 where the oil rate is given and not computed. See also claim 1 : "...for delivering pumped crude oil to the surface at a known oil production rate...". Therefore, Alexander does not disclose a method to compute oil volume by measuring the total organic carbon (TOC) in the drilled rock while taking

account of physical characteristics of the drilled rock and of the oil under the surface conditions.

In addition, the method described by Alexander necessitates the use of additional kit such as critical flow prover (column 3, lines 65 to column 4, line 3) and necessitates to temporarily block flow from annulus (column 3, lines 61-62), which represents additional costs for the operator.

Accordingly, clearly the Alexander patent does not anticipate the presently claimed invention.

In view of the foregoing amendments and remarks, favorable reconsideration and allowance of all of the claims now in the application are requested.

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To the extent necessary, applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to the deposit account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (Case: 612.42975X00), and please credit any excess fees to such deposit account.

Respectfully submitted,

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Attachment

Amendments to the Drawings:

The attached new drawing is a flow chart showing the method for estimating the volume ratio of gas to oil (GOR) in the fluids of a well during drilling according to the present invention.

New drawing